

Monolithic Linear IC

**SANYO**

No.2667A

**LA4538M**

Ripple Filter-Provided Stereo Power Amp  
for 1.5V Headphone Stereos

**Features**

- Low current dissipation
- Excellent reduced voltage characteristics
- Minimum number of external parts required
- On-chip power switch function
- Power amp section
  - Output power 8mW typ ( $V_{CC}=1.5V, R_L=16\Omega, f=1kHz, THD=10\%$ )
  - Ripple rejection 46dB typ ( $V_{CC}=1.0V, V_R=-30dBm, f_R=100Hz$ )
  - On-chip muting function
- Ripple filter section
  - Ripple rejection 39dB typ ( $V_{CC}=1.0V, V_R=-35dBm, f_R=100Hz$ )
  - Less output voltage loss
  - Pin 8 can be used to perform the muting function.

**Maximum Ratings at  $T_a=25^\circ C$** 

			unit
Maximum Supply Voltage	$V_{CC}$ max	Quiescent	4.5 V
Maximum Output Current	$I_{O7}$	Pin 7 flow-out current	5.0 mA
Allowable Power Dissipation	$P_d$ max		300 mW
Operating Temperature	$T_{opr}$		-20 to +75 $^\circ C$
Storage Temperature	$T_{stg}$		-40 to +125 $^\circ C$

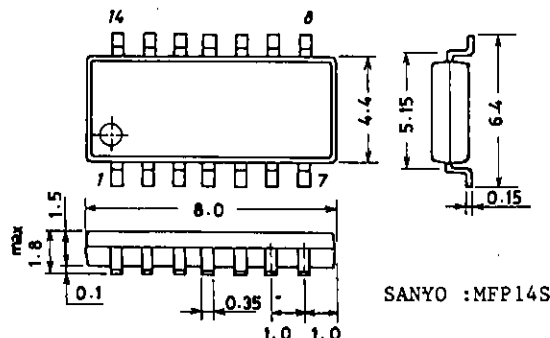
**Operating Conditions at  $T_a=25^\circ C$** 

			unit
Recommended Operating Voltage	$V_{CC}$		1.5 V
Operating Voltage Range	$V_{CC}$ op		0.9 to 4.0 V
Recommended Load Resistance	$R_L$		16 to 32 $\Omega$

**Operating Characteristics at  $T_a=25^\circ C, R_L=16\Omega, R_g=600\Omega$ , See specified Test Circuit.**

			min	typ	max	unit
Quiescent Current	$I_{CCO(1)}$	$V_{CC}=1.20V, \text{quiescent}, R_{L3} \rightarrow \text{OFF}$		4.5	7.0	mA
	$I_{CCO(2)}$	$V_{CC}=2.50V, \text{pin } 14 \rightarrow \text{GND}, R_{L3} \rightarrow \text{OFF}$		1.5	2.5	mA
	$I_{CCO(3)}$	$V_{CC}=2.50V, \text{pin } 1 \rightarrow \text{GND}, R_{L3} \rightarrow \text{OFF}$			1.0	$\mu A$
Voltage Gain	VG	$V_{CC}=0.90V, f=1kHz, V_o=-20dBm$	27.5	29	31.5	dB
Voltage Gain Difference	$\Delta VG$	$V_{CC}=0.90V, f=1kHz, V_o=-20dBm$			1.0	dB
Total Harmonic Distortion	THD	$V_{CC}=1.20V, f=1kHz, P_o=0.5mW$		0.9	1.5	%
Output Power	$P_o$	$V_{CC}=1.50V, f=1kHz, THD=10\%$	5	8		mW

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**Package Dimensions 3111-M14SIC**  
(unit: mm)

SANYO : MFP14S

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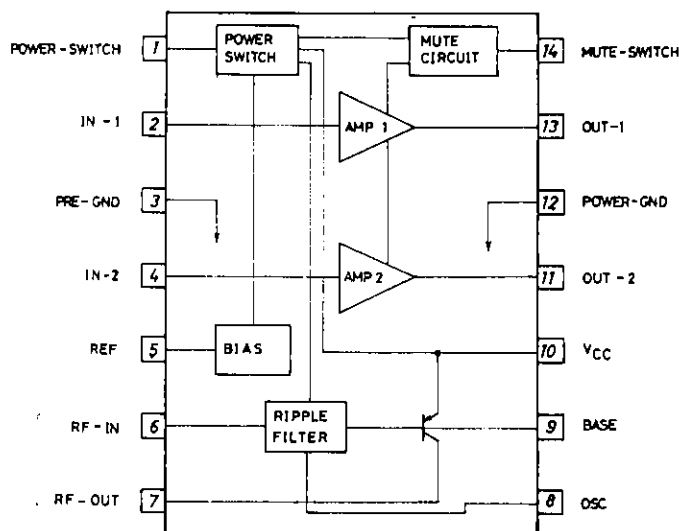
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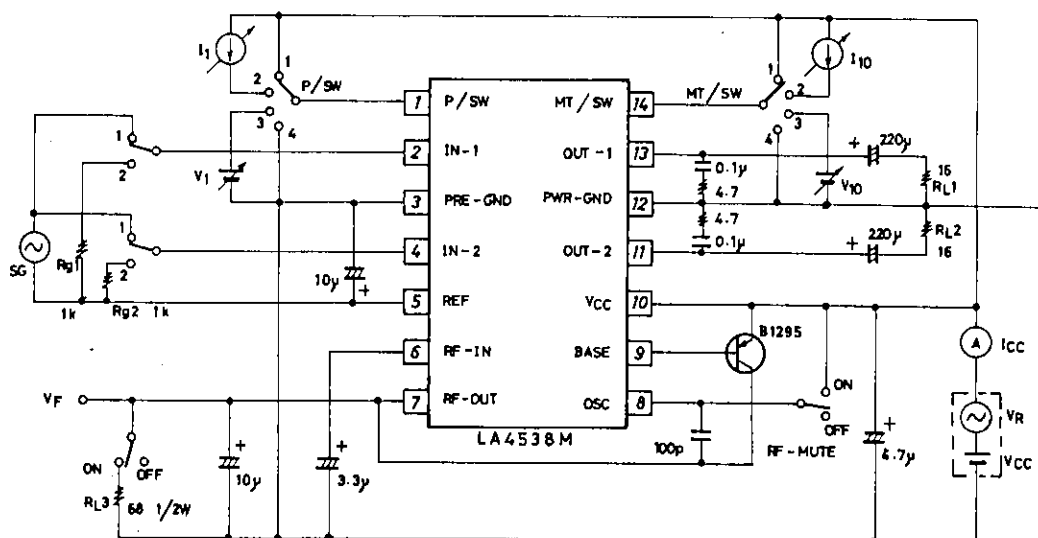
			min	typ	max	unit
Crosstalk	CT	$V_{CC}=1.20V, f=100Hz, R_g=1k\Omega, V_o=-20dBm$	40	45		dB
Ripple Rejection (Amp Section)	SVRR(1)	$V_{CC}=1.00V, f=100Hz, R_g=1k\Omega, V_R=-30dBm, BPF=100Hz$	40	46		dB
Ripple Rejection (Filter Section)	SVRR(2)	$V_{CC}=1.00V, f=100Hz, V_R=-35dBm$	34	39		dB
Output Noise Voltage	$V_{NO}$	$V_{CC}=2.50V, R_g=1k\Omega, BPF=20Hz$ to 20kHz		55	80	$\mu V$
Power ON-State Current Sensitivity	$I_{1(ON)}$	$V_{CC}=0.85V, V_{pin5} \geq 0.5V$		0.1	1.0	$\mu A$
Power OFF-State Voltage Sensitivity	$V_{1(OFF)}$	$V_{CC}=0.85V, V_{pin5} \leq 0.1V$	0.5	0.6		V
Muting ON-State Current Sensitivity	$I_{14(ON)}$	$V_{CC}=0.85V, V_{pin5} \geq 0.5V$		0.1	1.0	$\mu A$
Muting OFF-State Voltage Sensitivity	$V_{14(OFF)}$	$V_{CC}=0.85V, V_{pin5} \leq 0.1V$	0.5	0.6		V
Ripple Filter Output Voltage	$V_F$	$V_{CC}=1.00V, R_L=68\Omega$	0.90	0.94		V

## Equivalent Circuit Block Diagram

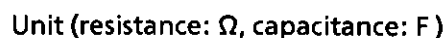


## Test Circuit

Unit (resistance:  $\Omega$ , capacitance: F)



### Sample Application Circuit



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